MURKY WATERS

Why the cholera epidemic in Luanda, Angola was a disaster waiting to happen

Doctors Without Borders/ Médecins Sans Frontières (MSF)
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Executive Summary

Since February 2006, the Angolan capital of Luanda has been experiencing its worst ever cholera epidemic, with an average of 500 new cases per day. The outbreak has also rapidly spread to other areas; to date, 11 of Angola’s 18 provinces are reporting cases.

The population of Luanda has doubled in the last ten years, and most of this growth is concentrated in slums where living conditions are appalling. Despite impressive revenues generated from oil and diamonds, there has been virtually no investment in basic services since the 1970s and only a privileged minority of the people living in Luanda have access to running water. The rest of the population get most of their water from a huge network of water trucks that collect water from two main points (Kifangondo at Bengo River in Cacuaco, and Kikuxi at Kuanza River in Viana) and then distribute it all over the city at a considerable profit. Water, the most basic of commodities, is a lucrative and at times complex business in Luanda, with prices that vary depending on demand.

Without sufficient quantities of water, and given the lack of proper drainage and garbage collection, disease is rampant in the vast slums. This disastrous water and sanitation situation makes it virtually impossible to contain the rapid spread of the outbreak.

Doctors Without Borders/Médecins Sans Frontières (MSF) is already working in ten cholera treatment centers in Luanda, and may open more in the coming weeks. Out of the 17,500 patients reported in the city (the figure for all of Angola is 34,000), more than 14,000 have been treated in MSF centers.

Despite significant efforts to ensure that patients have access to treatment, very little has been done to prevent hundreds more from becoming infected.
Like most African cities, Luanda has experienced rapid population growth over the last three decades. After independence in 1975 when the Portuguese abandoned the small farms around the city, the outward spread of the improvised and precarious settlements and slums, known as *musseques*¹, began. This expansion was continuous and was compounded by the steady arrival of people fleeing the fighting in the provinces. By 2000, the *musseques* extended 13 kilometers outside the city (Cain et al, 2002). The end of civil war in 2002 made it possible to move safely around the country, and with this new mobility a wave of arrivals settled in the capital. Population density has increased steadily, and the population of Luanda is currently estimated to be between 4.5 and 5.5 million people²,³.

The “concrete city,” the area comprising the old colonial town and the business and wealthy residential areas, is well serviced and occupies part of Ingombotas and Maianga municipalities. It is estimated that around 400,000 people live in the concrete city⁴, meaning that approximately 90 percent of the population of Luanda lives outside it in the *musseques*, areas that have grown without planning and where there has been virtually no investment in terms of water, sanitation, drainage, and waste disposal. This has led to appalling living conditions, and a disastrous health situation characterized by rampant disease and high mortality.

**The worst ever recorded cholera outbreak in Luanda**

Since February 13, 2006 a cholera outbreak has been raging in Luanda. By May 14, there were more than 17,500 cases reported in the city, with 245 deaths. However, registration of deaths in the community is highly deficient, so accurate mortality rates are almost impossible to ascertain (of the 245 deaths reported, only 96 were in the community. See below for more details on mortality).

Cholera is endemic to Luanda. In the late 1980s and up to 1991, there was a cholera outbreak every year, the largest in 1991 with over 8,000 cases reported. The next outbreak occurred in 1994 with over 4,000 cases, with no further outbreaks reported until now.

The current outbreak has quickly spread to other provinces; as of May 14, 11 of the 18 provinces were reporting cases. The rise in the number of cases in some of the large provincial towns has been extremely rapid and marked by very high mortality (over 15 percent case fatality rate⁵ in some places). Currently, the most affected cities after Luanda are Benguela and Malange, and there is a worrying increase of cases in Lubango.

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¹ After the Kimbundo word for the sandy soil on which the settlements are built.
² Depending on the sources. Estimates calculated on projections from the last census (1988) would indicate a total population of 4.5 million; according to vaccination records the population exceeds five million.
³ The city is divided into nine municipalities: Ingombotas, Maianga, Samba, Rangel, Sambizanga, Cazenga, Kilamba Kiaxi, Cacuaco, and Viana.
⁴ Meetings with different agencies and civil servants
⁵ In urban settings, a case fatality rate >2% is considered indicative of poor/bad case management.
The first cases emerged in the area of Boa Vista (Ingombotas Municipality) and since then the cholera epidemic has reached all municipalities of Luanda. After peaking in Boa Vista, the outbreak moved to Sambizanga and then to Cacuaco. Looking at epidemiological data of the previous outbreak, as well as the current evolution of cases, it was anticipated that Cazenga, Samba, Maianga, and Viana municipios would soon see a sharp increase in the number of cases.

**Mortality**

As mentioned above, there are serious concerns over epidemiological surveillance, and, in particular, over the registration of deaths in the community. An assessment of the most affected municipalities has revealed that there is not a standardized system to register and report deaths that occur outside a hospital structure; in some municipalities there is simply no registration at all. In order to have a more realistic approximation of the real number of deaths, MSF consulted the register books of the two main cemeteries in Luanda where the majority of burials take place (Mulemba and Kamama). In these two cemeteries alone, the number of burials from February 13 to April 30 of people whose registered cause of death was cholera totalled 437, compared to 173 reported by the Ministry of Health (MINSA) during the same period.

*NB: 2006 cases up to 30 April
NB: this graph does not include the cases from 1994, as no official records were found*
For the same period in the same two cemeteries, there were also 211 burials of people whose cause of death was registered as “acute diarrhoea.” Given the very poor mechanisms to establish the cause of death for people that die at home, and given the fact that there is a cholera outbreak, it could be assumed that at least part of these deaths may also be attributable to cholera.

Furthermore, as mentioned above, these data only reflect burials in two of the six official cemeteries in Luanda. While most burials take place in the two largest cemeteries of Mulemba and Kamama (the others either being smaller or lacking space), there is an unofficial cemetery in Viana municipality (Mulenvos cemetery) where people are buried without an official death certificate. Assessments of the rest of the Luanda cemeteries, including Mulenvos, will most likely reveal a higher number of deaths due to cholera.

**Response to the outbreak**

The response to the outbreak has been very slow and the resources deployed have been largely insufficient. Given that it has been many years since the last epidemic, and in view of the disastrous water and sanitation conditions in most of the city, the risk of a major epidemic explosion should have been foreseen, and massive resources should have been mobilised the moment the outbreak was declared. Instead, it took two-and-a-half months for the national crisis committee to be activated and for Parliament to allocate $5 million (US) to the emergency response. Despite these measures, concrete action from ministries other than the Ministry of Health (MINSA) is still not apparent.

MSF has already set up ten cholera treatment centers in the most affected areas, and may open more in the coming weeks. Of the 17,500 patients reported in Luanda since the beginning of the epidemic, more than 14,000 have been treated in MSF centers.
Despite these efforts, much work remains to be done (i.e. establishing more treatment units and re-hydration points, and increasing referral capacity and active case finding) to ensure that patients are identified and referred in a timely fashion to treatment centers.

But by far the most worrying aspect of the response is the very limited means dedicated to containing the outbreak. Massive resources need to be mobilized immediately to guarantee access to clean water free of charge in the _musseques_. Without sufficient quantities of water, it is impossible to ensure minimum hygienic measures. Telling people that they must wash their hands is not going to work if they have barely enough water to drink. Equally, efforts need to be stepped up to ensure that the key prevention activities mentioned above are implemented.

In a town where at least 70 percent of the people depend on a business network of tanker trucks to get their water, an adequate response in terms of water provision would no doubt affect many private interests (see section below on water). This may explain the unacceptable delay in ensuring an emergency response to this very grave situation.

If pragmatic and efficient measures to increase the availability of water are not implemented urgently, the conditions are rife for this outbreak to last for months.
Water

The water distribution network of Luanda comprises approximately 650 kilometers of pipe, and the provision of safe drinking water is provided through four different systems. When it leaves the treatment plant, the water provided from these systems is of good quality. Yet the pipes have exceeded their life-span and there are parts that are seriously damaged, increasing the risk of contamination of water during transportation.

This network mostly covers the “concrete city,” the wealthy part of Luanda, and extends to other municipalities, mainly to service the few factories that are situated in the periphery. In the musseques, between 70 to 100 percent of the population buy water from private vendors (DW, 1995).

According to a study conducted in 2002, 17 percent of the households in Luanda report a water connection, but only 10 percent have a direct connection to running water inside their households (DW, 2002:4). The rest of the population, in the absence of a public distribution network of water, pay high prices for water provided by private suppliers and distributed by tanker trucks. The often contaminated water is sold to water vendors that own underground water tanks and who in turn sell water by the bucket to households.

In areas that depend largely or exclusively on water trucking, people make do with dangerously low amounts of water. A 2002 study of the situation in two adjacent communities in the municipalities of Sambizanga and Cazenga showed that the average consumption of water (for drinking, cooking, washing, and cleaning) per person per day was 7.6 liters, much below the internationally agreed-upon minimum standard of 20 liters per person per day. By comparison, the average consumption in western countries ranges between 200 and 600 liters per person per day.

In the slums of Luanda, no significant project has been completed over the last decades to improve availability of water in sufficient quantity and quality at a reasonable price. In fact, the situation has deteriorated. In 1989 a water station was built in Mulemba, which was meant to become the second biggest treatment and distribution station of Luanda. But it never opened, as the project to build the distribution network was aborted. Several large projects have been approved since 2003, but these are yet to be realised. Therefore, despite existing plans, there is no concrete change for the

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6 The water production and distribution system in Luanda is managed by EPAL (Empresa Publica de Aguas de Luanda), which currently operates under a cost-recovery system.
7 System I (built in 1953) and System II (built in 1971/81) obtain water from the Bengo River, and System III (built in 1998/2000) and Kikuxi (1985) get it from the Kuanza River.
8 In addition, these damaged pipes, which are very close to the surface or even exposed, cross kilometers of musseques, with numerous garbage fields in which open air defecation is very common.
9 To take the example of Cazenga, there are main pipes that bring water to a number of factories situated at the far south-eastern corner of the municipality. Next to two large factories is a school compound and next to it an old public tap stand. Today, the taps are closed despite the fact that the pipes beneath them continue to supply water to the factories. The school needs to buy its water from the trucks.
10 The station is currently closed. It would be possible to obtain water, but it would need to rely on water trucks.
millions of people that do not have access to running water and so “the poorest people use less water, use poorer quality water, boil or treat it less and spend more money and time obtaining it” (Cain et al, 2002:11)

The water trucking business

There are seven points where water trucks can collect water in Luanda. The main one is Kifangondo, near the Bengo River, which fills around 450 tanker loads per day (five million liters). Kikuxi is the second largest collection point and the raw water is drawn from the Kwanza River with an average capacity of 150 fills per day. The other five are smaller and draw already treated water from the EPAL (Empresa Publica de Aguas de Luanda) network. These points see considerably less traffic as the whole process is slower.

It is currently estimated that there are around 330 tanker trucks in Luanda, of which the great majority are privately owned. Most of these are organized in a cartel-like association and obtain their water from the Kifangondo water treatment plant.

At the Kifangondo station, raw water from the Bengo River is pumped directly into the trucks. Before leaving the station, tanker drivers are supposed to go through a chlorination point. However, in order to avoid queuing and thus gain time to do as many round trips as possible to get more water, many trucks leave the station without having been chlorinated.

When MSF assessed Kifangondo in April, well into the cholera outbreak, only 10 percent of the tanker trucks were being chlorinated. The river was visibly contaminated. Samples taken tested negative for the cholera vibrio, yet the national laboratory declared that the water from the Bengo River was unfit for human consumption. However, no action was taken to ensure stricter control of chlorination. No further tests have been carried out since. As the outbreak expands and more and more contaminated waste is washed into the river with the sporadic heavy rains, the possibility that the river becomes contaminated with the cholera vibrio increases, and the trucks could be a medium for spreading the disease. Since April 22, MSF has organized teams in Kifangondo to ensure that all 450 tanker loads collecting water at this point are adequately chlorinated.
**Water tanks in the community**

Most of the tanks owned by the water vendors are built underground and are covered by ill-fitting or inadequate lids. Due to the dubious construction of some of the tanks and the fact that they are open and seldom cleaned, these water points are highly exposed to contamination. Equally, at home, a lack of adequate material and limited knowledge of basic hygiene result in unsafe practices, and water is often kept in open containers and within reach of children. By the time water is finally consumed it may well be contaminated.

**Price of water**

Ironically, the price of water, the most basic of commodities, decreases the closer one is to the wealthy parts of town. **Running water is up to 160 times cheaper than the potentially contaminated water from water trucks that poor people in the musseques depend on.**

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<tr>
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<th>Price for 10 liters</th>
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<tr>
<td><strong>Running water (EPAL)</strong></td>
<td>0.24 Angolan Kwanza (kz)</td>
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<tr>
<td>Water at Kifangondo (from the river to the trucks)</td>
<td>0.04 kz</td>
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<tr>
<td>From the trucks (what vendors with tanks pay to the tanker trucks)</td>
<td>1 kz (average)</td>
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<tr>
<td><strong>From the tanks (what householders pay to the vendors)</strong></td>
<td>Between 15-25 kz (although in moments of high demand it can rise to 40 kz)</td>
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Source: MSF field assessments

The final price of water is determined by market forces. Water prices are thus subject to speculation and can vary even on a daily basis depending on access (distance from the water collection point to the distribution point, and the conditions of the road that leads to the final distribution point) and demand (availability of water in nearby areas).

The private water sector, which responds to the needs of the majority of the population of Luanda, is clearly a highly profitable business, whereby both the owners of the water trucks and the vendors that own tanks in the community benefit from large profit margins.

At the other end of the spectrum, the people in the musseques survive in sometimes extreme poverty and limit their water consumption, not because of a lack of water or because it is too far to collect it, but simply because they cannot afford to buy more.

**Sanitation**

In the musseques, the sanitation conditions are disastrous. There are areas where people literally live on mountains of garbage and it is estimated that about one-third of the population neither has nor uses sanitary facilities of any kind.
Many people take advantage of the night to defecate in open areas, in the streets, and on the garbage dumps, even if defecation in public is considered a very dirty habit. The lack of water seems to be the first reason for such practice. The non-governmental organization Development Workshop reports that many children do not frequently use latrines. Some adults who have a latrine at home sometimes defecate in the open when they don’t have enough water to use in a pour-flush type of latrine, or when their dry pit latrine is inundated with water after heavy rains.

An organized sewage and drainage system is non-existent in most of the musseques. When it exists, it rarely functions well. This situation creates huge problems during the rainy season, as houses and latrines are flooded, excreta and rubbish are washed away and pools of stagnant contaminated water abound.

This situation has a very negative effect on the overall health of the population year round. During a cholera outbreak it is a recipe for disaster.

**Solid waste management**

Mountains of rubbish are a common sight as soon as one leaves the concrete city. While residents of the musseques usually keep their yards and houses scrupulously clean, they have nowhere to take their garbage, and there is no organized waste collection service covering the area.

Without a regular garbage collection system in the musseques, an ever-increasing volume of untreated, unmanaged waste is dumped in unofficial waste sites very close to or right inside densely populated areas. These rotting heaps become quagmires during the rainy season and are all too often the only playgrounds for children.
In 1994 there were approximately 900 informal dumpsites across the city of Luanda, covering a total area of 40 hectares with an estimated volume of around 170,000 m³. To eliminate this backlog would require ten dump trucks making three trips per day to the landfill, working seven days a week for a period of two years (Hailemichel, 2004).

**CONCLUSION**

Luanda is currently the scene of the largest cholera outbreak ever registered in the country. The epidemic has spread throughout the whole city like bush-fire and not a single corner of the vast capital has been spared. With more than 17,500 cases already reported and hundreds of people dead, there are currently no signs that the situation will improve in the coming weeks.

While MSF has stepped up efforts to ensure that patients have access to treatment centers and has prepared plans to open new treatment centers to reach even more people, there is still a dramatic gap in the means dedicated to contain the outbreak.

The disastrous water and sanitation conditions create the perfect breeding ground for disease. Cholera is right in its element in the vast slums of Luanda.
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